MILSATCOM Air Force Terminal Programs
New Horizons Symposium

13-14 November 1997

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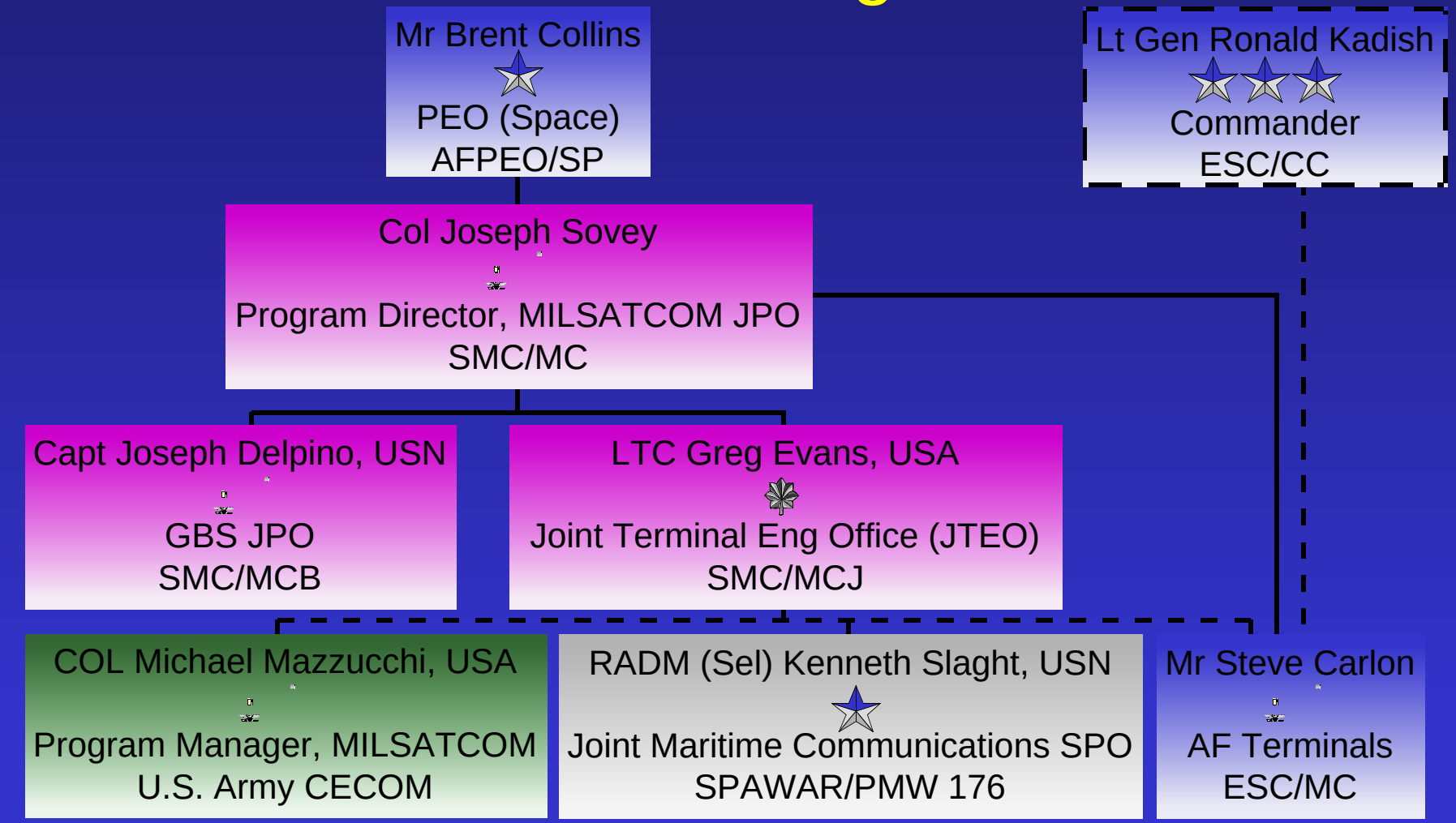
Outline

- Organization - the MILSATCOM community
- Mission - The big picture and our little piece
- The future of MILSATCOM
  - Overview of Programs
  - Industry opportunities
  - Future needs/trends

Organization
The MILSATCOM Community

- ESC/MC is just one player on the team
- The Decision Makers!
  - Joint Space Management Board (JSMB)
  - Joint Requirements Oversight Council (JROC)
  - Deputy Undersecretary of Defense for Space (DUSD(Space))
    - Office of the Space Architect (DoDOSA)
  - Defense Information Systems Agency (DISA)
  - United States Space Command (USSPC)
  - Air Force Director of Operations (AF/XO)
  - Air and Space Command and Control Agency (ASC2A)
  - Air Force Chief Information Officer (AFCIO)

Organization
MILSATCOM Joint Program Office



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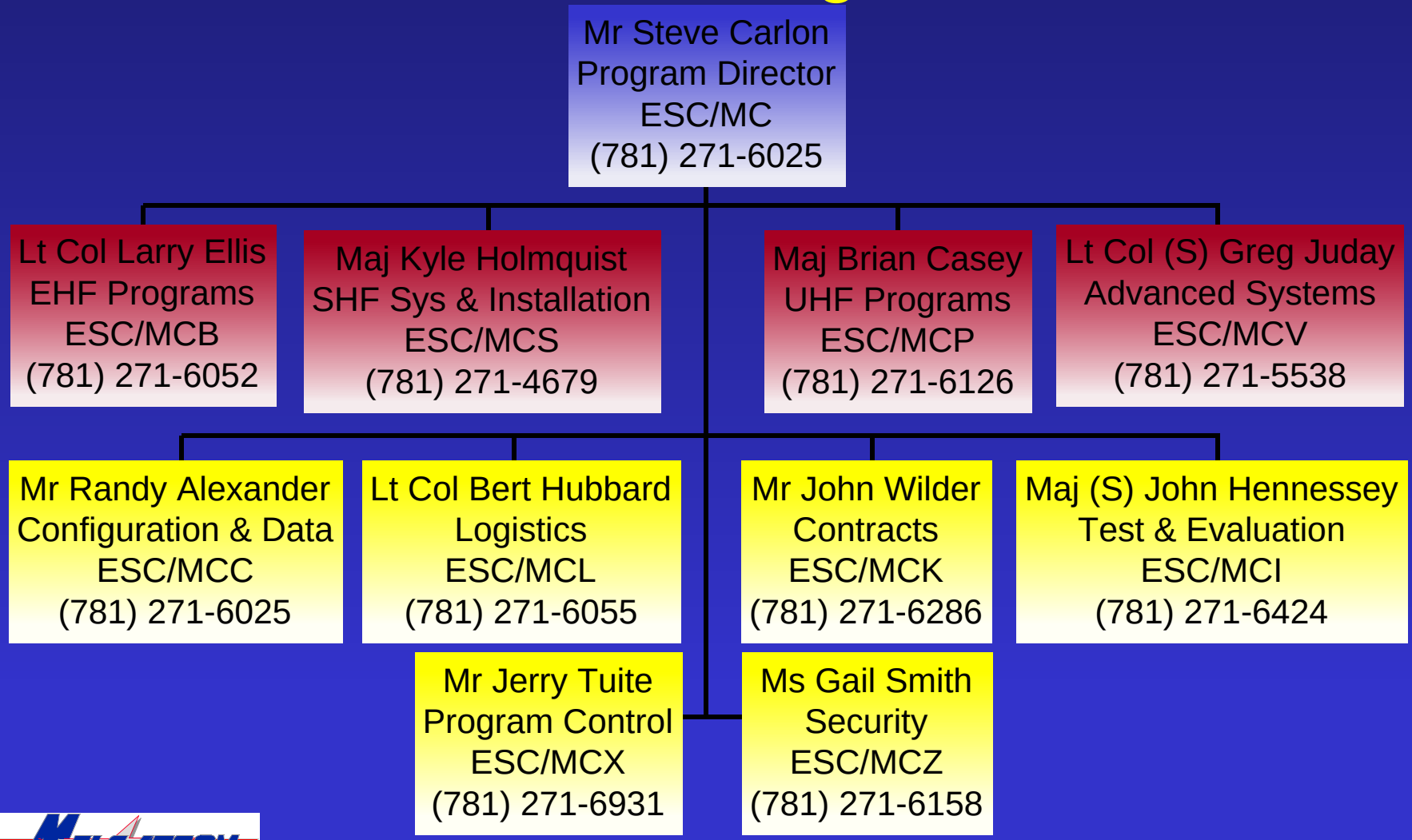
Organization
Air Force Terminal Program Office



Mission
Air Force Terminal Program Office

"Singularly responsible to develop, procure, deploy, and sustain all Air Force satellite terminals for the global communications needs of the national command authorities and theater land, naval and air warfare forces in all levels of conflict. Integrates advanced and existing technologies to provide interoperable terminals for ground and airborne platforms."

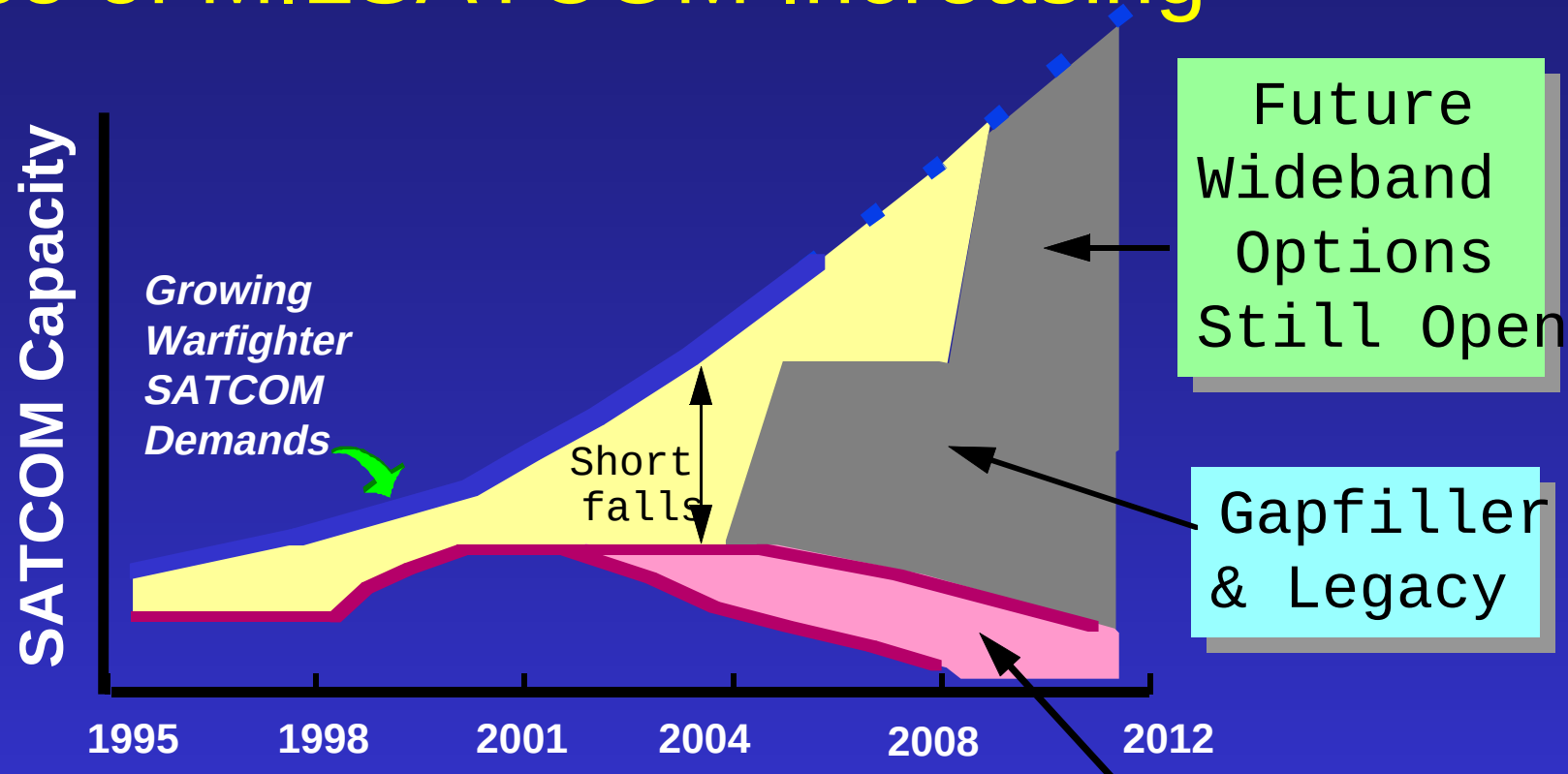
Mission (continued)
Military Satellite Communications

Provide beyond line of sight (BLOS) communications to military forces in a variety of situations and missions.

Mission (continued)
Air Force Terminal Program Office

- Meet warfighter needs
  - Air Force users
    - Ground and Airborne
  - National Command Authority (NCA) users
- Maximize cooperative efforts with government and industry
  - Army Ground Terminals
  - Commercial Ventures

Mission (continued)
Use of MILSATCOM Increasing

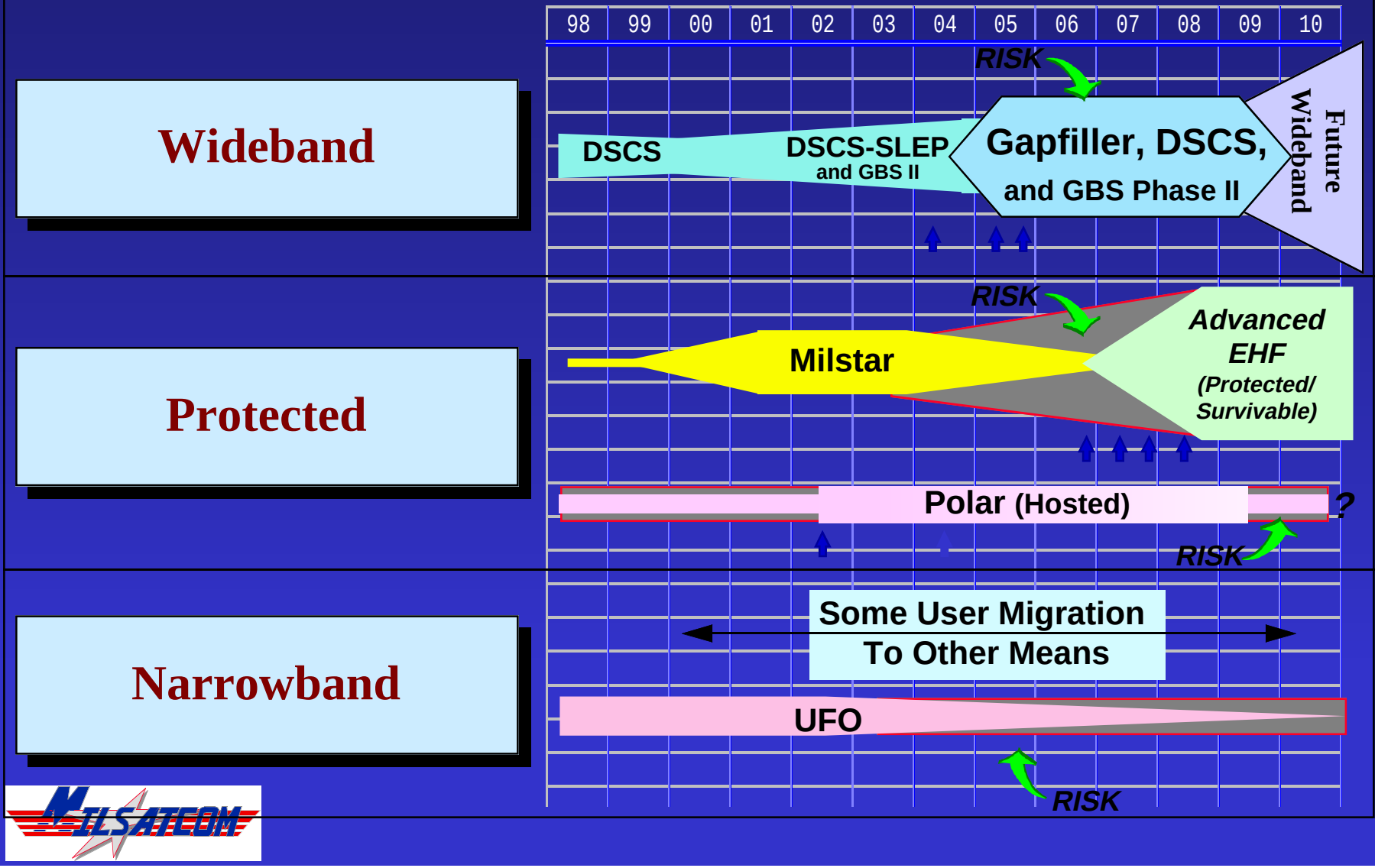


***Today's* SATCOM Systems:**
-- **Demands Exceeding Capacity**
-- **Have Finite Life Spans**

Overview
Current and Future MILSATCOM

- Large population of legacy terminals and satellites
  - Any new systems must be backward compatible or have replacement for legacy system
- Current Procurements
  - How do you meld current acquisitions with both legacy systems and an “fuzzy” future
- Near-Term Solutions
  - Bridging the gap between “today” and “tomorrow”
- Long-Term Goals
  - Here is where we want to go, but…
    - …how to we get there...
      - …and can we afford it?

Overview (continued)
Future MILSATCOM Architecture



Overview (continued)
Current and Fielded Systems

- Wideband
  - Defense SATCOM System (DSCS) Terminals
  - Lightweight Multiband Satellite Terminals (LMSTs)
  - Single Channel Transponder System (SCTS) Terminals
  - Global Broadcast Service (GBS)
- Protected
  - AF Ground Command Post Terminal (AFCPT)
  - Mobile Ground Station (MGS)
  - SMART-T/SCAMP (Army)
  - Advanced EHF MILSATCOM Engineering Model
- Narrowband
  - Enhanced Manpack UHF Terminals (EMUTs)
  - Airborne Integrated Terminal (AIT)

Overview (continued)
New Projects

- Wideband
  - Ground Mobile Forces (GMF) Replacement
- Protected
  - Airborne Advanced EHF Terminal
  - Fixed Site SCAMP (GWEN Replacement)
- Narrowband
  - Mobile Satellite Services (MSS)

Industry Participation - Air Force Terminals

- ESC/MC is looking to collaborate with industry in terminal technology and doctrine development
- Demonstrations - EFX and Others
  - Opportunities for CRDAs and vendor prototyping
- Commercial Exploration
  - Looking at fulfilling AF customers needs with commercial alternatives in the areas of wideband broadcast and personal communications services (PCS)
- Conventional Contracts

Summary

- MILSATCOM is becoming a “linchpin” system
  - Users are relying increasingly on BLOS communications
  - MILSATCOM community is adapting architecture to meet that need
- ESC/MC is AF’s primary advocate for terminals
  - Emphasis on leveraging wideband and narrowband with commercial ventures
  - Protected services still need to be military
    - What can we learn from commercial?

Existing Contract

- AF Ground Command Post Terminal (AFCPT)
  - Awarded by ESC
    - Raytheon
    - Rockwell
  - Field 65 Milstar LDR EHF and EHF/UHF airborne (25), ground (25), and transportable (15) SATCOM terminals
  - Mission: EAM dissemination, Force Direction, Reportback, and ITW/AA
  - Users: NCA, CINCs, and MAJCOMs

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Existing Contract

Mobile Ground Station (MGS)

Awarded by ESC

- Raytheon

Provide Milstar connectivity to Defense Support Program (DSP) Mobile Ground Stations (MGS)

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Existing Contract

Secure, Mobile, Antijam, Reliable Tactical Terminal (SMART-T)

Awarded by U.S. Army CECOM - Feb 96

- Raytheon: DAAB07-96-C-A757

Products/Services:

- Deliver 73 SMART-Ts to AF users
- Schedule: FY99-03

Mission: EAM, Force Direction, Force Management

Users: ACC, AMC, AIA, AFSPC, PACAF, USAFE

Current value $4.4M / estimated total value $33.7M (AF Portion Only)

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Existing Contract

- Several Channel Antijam Manpack (SCAMP)

  Awarded by U.S. Army CECOM - Feb 96
  - Rockwell: DAAB07-96-C-A760

  Products/Services:
  - Deliver 154 SCAMPs to AF users
  - Schedule: FY98-99

  Mission: EAM, Force Direction, Force Management, Combat Control Teams (AFSOC)

  Users: USSTRATCOM, AFSOC

  Current value $18M / estimated total value $27M (AF Portion Only)

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Existing Contract

Advanced EHF MILSATCOM Engineering Model

Awarded by SMC - Oct 97

- Hughes
- TRW

Products/Services:

- Risk reduction of advanced EHF SATCOM

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Existing Contract

- Defense Satellite Communications System (DSCS) Terminals

  Products/Services:

  - Install, test, and modify/upgrade 35 DSCS terminals
    - GSC-39 (5), GSC-49 (15), GSC-52 (9), FSC-78 (6)

  Mission: EAM, Force Direction, ITW/AA, JCS SHF CINC Network

  Users: JCS, AFSPC, USCENTCOM, ACC, USAFE, AMC, PACAF, USSPACECOM, Special Users

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Existing Contract

- Lightweight Multiband Satellite Terminals (LMSTs)
  - Awarded by Army CECOM
    - Raytheon
  - Products/Services:
    - Deliver 66 LMSTs to AF Users
  - Mission: Theater Deployable Communications (TDC) at C-, X-, Ku-bands
  - Users: ACC, AMC, AFSOC

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Existing Contract

- Single Channel Transponder System (SCTS) Terminals
  - Awarded by ESC
  - Products/Services:
    - Install and modify/upgrade Single Channel Transponder System (SCTS) terminals
      - SCTIS (12), ISST (57), NAOC (4), SCTR (42)
  - Mission: EAM, Force Direction
  - Users: EUCOM, NMCC, USSTRATCOM, USSPACECOM, USPACOM, NAOC

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Existing Contract

- Enhanced Manpack UHF Terminals (EMUTs)
  - Awarded by Army CECOM
  - Products/Services
    - Deliver 919 EMUTs to AF Users through Army PM MILSATCOM
  - Mission: Provide UHF 5 kHz and 25 kHz DAMA SATCOM and UHF/VHF line-of-sight capability for various missions
  - Users: ACC, AMC, AFSOC, PACAF, USAF

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Pending Contract

Global Broadcast Service (GBS)

Contract Award by SMC - Nov 97

- TBD

Products/Services:

- Provide satellite broadcast services to various DoD agencies

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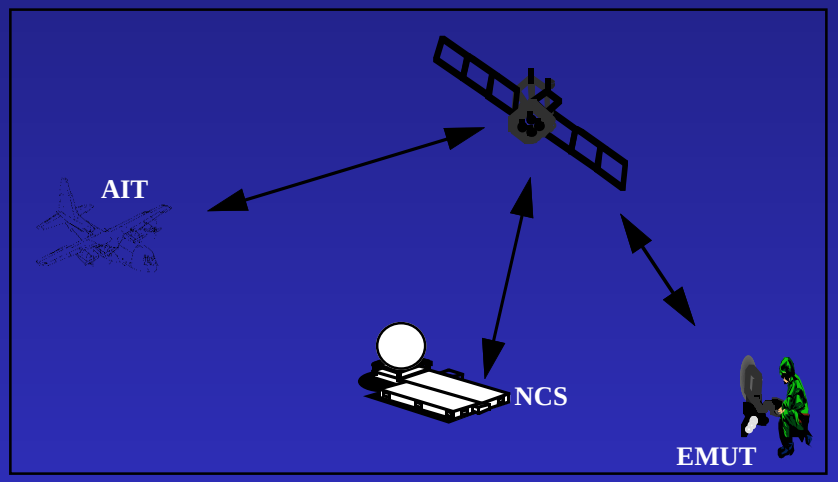
Pending Contract

Airborne Integrated Terminal (AIT)

RFP Released - Sep 97

Products/Services:

- 530 terminals on 16 platforms



Mission: Provide UHF 5 kHz and 25 kHz DAMA SATCOM and UHF line-of-sight capability for various missions

Users: ACC (382+1), AMC (148+1)

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Overview
New Projects

Airborne Advanced EHF Terminal

Schedule:

- Issue RFP: 1Q FY00
- Contract Award: 3Q FY00

Customer: ACC, AFSOC

POC:

- Major Greg Juday
- ESC/MCV
- (781) 271-5538

Industry Opportunity

Project: Airborne Advanced EHF Terminal

- Objective: develop, procure, and install advanced EHF terminal into multiple airborne platforms
- Anticipated procurement approach
  - Strategy: competitive source selection
  - Prior Efforts: LCT Demonstration Program
  - Small business opportunities: subcontracting only
  - Subcontracting opportunities:
    - Power amplifiers, antennas, terminal electronics
  - Contract type: CPAF

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Overview
New Projects

Fixed Site SCAMP (GWEN Replacement)

Schedule:

- Issue RFP: 1Q FY99
- Contract Award: 1Q FY99

Customer: USSTRATCOM

POC:

- Captain Joe Stupic
- ESC/MCS
- (781) 271-6339

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Industry Opportunity

Project: Fixed Site SCAMP

- Objective: produce and install EHF terminal into strategic wing operations center for reception of emergency action message (EAM)
  - Replaces ground wave emergency network (GWEN)
- Anticipated procurement approach
  - Prior Efforts: Army SCAMP program
  - Small business opportunities: subcontracting only
  - Subcontracting opportunities:
    - Radomes, environmental control, site preparation
  - Contract type: FFP

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Overview
New Projects

Ground Mobile Forces (GMF) Replacement

Schedule:

- Issue RFP: 1Q FY00
- Contract Award: 3Q FY00

Customer: ACC, USAFE, PACAF, AETC, ANG, AFRES

Mission: Joint Contingency Operations, Tactical Air Control System

POC:

- Captain James Herrick
- ESC/MCS
- (781) 271-6434

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Industry Opportunity

Project: Ground Mobile Forces (GMF) Replacement

- Objective: produce and install replacement terminals for AF users
  - Ground mobile forces (GMF) (111), NATO airbase SATCOM (NABS) (52)
- Anticipated procurement approach
  - Strategy: competitive source selection
  - Prior Efforts: GMF/NABS contracts
  - Small business opportunities: subcontracting only
  - Subcontracting opportunities: TBD
  - Contract type: CPAF

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Overview
New Projects

Mobile Satellite Services (MSS)

Schedule:

- Issue ECP: 1Q FY00
- Begin Delivery: 3Q FY00

Customer: ACC, AFSOC, AMC

POC:

- Captain Earl Kinsley
- ESC/MCV
- (781) 271-6036

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Industry Opportunity

Project: Mobile Satellite Services (MSS)

- Objective: Produce and install MSS-compatible handsets for AF ground and airborne units
- Anticipated procurement approach
  - Strategy: Extend existing DISA contract to include aircraft handsets
  - Prior Efforts: DISA MSS Program
  - Small business opportunities: subcontracting only
  - Subcontracting opportunities: TBD
  - Contract type: FFP

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Future Needs/Trends

MILSATCOM Requirements Definition

- DoD MILSATCOM Architecture
  - AFTPO is active player in architecture development team
  - Architecture shows need for long-range AF terminal plan
- AFTPO is assisting with AF SATCOM requirements
  - Works with AFSPC in talking to ACC/AFSOC/AMC
    - Helping define of AF emerging requirements for USSPACECOM requirements database
  - Developed 20-year AF terminal roadmap, which includes:
    - Current terminal populations & end-of-life projections
    - Future term population based on current/emerging ops
    - Ensures warfighter needs will be met!

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Future Needs/Trends (continued)

- Commercial airborne and mobile SATCOM is ballooning market
  - Iridium, Celestri, Teledesic, INMARSAT, and others are developing systems at same or adjacent frequency bands
  - CSCI encourages AFTPO to craft CRDA agreements to accelerate technology insertions and demonstrations
    - EFX ‘98 and ‘99 important to AF users
- Fact of life: MILSATCOM will rely heavily on commercial SATCOM services and technologies in the future!

Future Needs/Trends (continued)

Airborne Terminal Direction

- Single wideband (WB) terminal per aircraft
  - Simultaneous broadcast receive (~ 6-8 Mbps) and full duplex communications (~2400 bps - 2 Mbps)
    - Worldwide connectivity in theater and enroute
    - Fully integrated with the emerging C2 infrastructure
- Maximize commonality of WB terminal component
  - Baseband elements (e.g., S/W, firmware, waveform, IF,...)
  - RF variations to accommodate different frequency bands
- Reduce integration costs
  - Advanced antenna designs, adopt commercial integration concepts, fewer terminal programs

Future Needs/Trends (continued)

Ground Terminal Considerations

- Integration into the Air Force tactical C2 platforms (JFACC, AOC, TABs)
  - Backward compatible baseband I/Fs to existing systems
  - Smaller, less airlift, lower O&S costs
  - Forward compatible with new C2 systems (e.g., GCCS)
  - Joint interoperability
  - High capacity to support Common Operational Picture
    - Videoconference, PTP, PTMP, broadcast, ...
- Air Force SIOP Terminals
  - Integration into existing infrastructure (EAM, reportback)
  - Nuclear survivability

MILSATCOM

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Future Needs/Trends (continued)

Technology Focal Areas

- Airborne MILSATCOM Technology Trends
  - Minimize penetrations, protrusions and intrusions
  - Maximize coverage and data rates
- Aircraft antennas not maturing fast enough
- Solid state power amplifiers still inefficient; tube amplifiers unreliable
- General Problems
  - DoD quantities insignificant compared to commercial
  - EHF MILSATCOM far above commercial ventures
- Aircraft integration single biggest issue

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